

O.I.P.E.
JUL 02 2002
PATENT & TRADEMARK

Figure 1

Verfi: 1 to 3640

CGGGGGAGTGGGGAGGAGGGGGTGGGCGCGCCAGCCATGGAGGCCAACTGGAGCGGTTCCTGTTCAGGCCCAAGCATCCCAT 90
M E A N W T A F L F Q A H E A S H 17

CACCAACAGCAGGCGAGCGCAGAACAGCTTGTCTGCCCTCTGTAGTTCTGTGTGGAGCCCTGATCAGAAACCGTTGCTTCCAATACCA 180
H Q Q Q A A Q N S L L P L L S S A V E P P D Q K P L L P I P 47

ATTACTCAGAAACCTCAGGCTGCACCAGAAACATTAAAGGATGCCATTGGGATTAAAAAGAAAAACCCAAAACCTTCTTTGTGTGCACT 270
I T Q K P Q A A P E T L K D A I G I K K E K P K T S F V C T 77

TACTGCAGTAAAGCATTACAGGACAGCTATCACCTGAGGCGCCATCAGTCTGCCACACAGGGATCAAGTTGGTGTCTCGGGCAAGAAA 360
Y C S K A F R D S Y H L R R H O S C H T G I K L V S R A K K 107

ACCCCCACACGGTGGTTCCTTATCTCCACCATTTGTGGGACAGCAGCCGAACCTTGGTGGTTCAACTATTGCAGGCATCTTTGTCA 450
T P T T V V P L I S T I A G D S S R T S L V S T I A G I L S 137

ACAGTCACTACATCTTCTCGGACCAACCCAGCAGCAGCGTAGTACCACAGCAATGCCTGTGCCCCAGTCTGTCAAGAAACCCAGT 540
T V T T S S S G T N P S S S A S T T A M P V P Q S V K K P S 167

AAGCCTGTCAAGAGAACACCGCTGTGAGATGTGTGGGAAGGCCTTCCGGGATGTGTACCACCTCAATCGGCACAGCTCTCCCATTCG 630
K P V K K N H A C E M C G K A F R D V Y H L N R H K L S H S 197

GACGAAAGCCCTTTGAGTGTCTTATTGTAAATCAGCGCTTCAAGAGGAAGGACCGGATGACTTACCATGTGAGGTCTCATGAAGAGGC 720
D E K P F E C P I C N O R F K R K D R M T Y H V R S H E G G 227

ATCACCAAACCTTATCTTGCAGTGTGTGTGGAAAGGCTTCTCAAGGCGCTGACCACCTAAGCTGTATGTAAACATGTGCATTCAACA 810
I T K P Y T C S V C G K G F S R P D H L S C H V K H V H S T 257

GAAAGACCCCTTCAATGCCAAACGTGCACTGCTGCCCTTGGCCACCAAGACAGACTACGGACACACATGGTGGCCACGAAGGCAAGGTA 900
E R P F K C O T C T A A F A T K D R L R T H M V R H E G K V 287

TCATGTAAATCTGTGGGAAGCTTCTGAGTGCAGCATATATCACCAGCCACTTAAAGACACATGGGCAGAGCCAAAGTATCAACTGTAA 990
S C N I C G K L L S A A Y I T S H L K T E G Q S Q S I N C N 317

ACGTGCAACAAAGGCATCAGCAAAACGTGCACTGAGTGGAGAGCAGCAATCAGAAGCAGCAGCAGCAGCAGCAACAGCAGCAGCAG 1080
T C K Q G I S K T C M S E E T S N Q K Q Q Q Q Q Q Q Q Q Q 347

CAACAACAACATGTGACAAGCTGGCCAGGGAAGCAGGTAGAGACACTGAGACTGTGGGAAGAAGCTGTCAAAGCAAGAAAGAAAGAA 1170
Q Q Q Q H V T S W P G K Q V E T L R L W E E A V K A R K K E 377

GCTGCCAACCTGTGCCAAACCTCCACGGCTGCTACGACACAGTGACTCTCACTACTCCATTCAATATAAGTCTCTGTGTCTGTGGG 1260
A A N L C Q T S T A A T T P V T L T T P F N I T S S V S S G 407

ACTATGTCAAACCCAGTCAAGTGGCAGCTGCAATGAGCATGAGAAGTCCAGTAAATGTCTCAAGTGCAGTTAACATAACAGCCCTTAA 1350
T M S N P V T V A A A N S M R S P V N V S S A V N I T S P L 437

GCCATGACCTCACCTTTAACACTCACACCCAGTCAACCTCCCCACCCCTGTGACCGCCCCAGTGAATATAGCACACCTGTCAACCATC 1440
A M T S P L T L T T P V N L P T P V T A P V N I A H P V T I 467

ACATCTCCAATGAACCTGCCCACTCTATGACATTAGCTGCCCTCTCAATATAGCAATGAGGCTGTAGAAAGTATGCCCTTCTTGCCC 1530
T S P M N L A P T P M T L A A P L N I A M R P V E S M P F L P 497

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Q A L P T S P P W 506

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GCTGGCAAGACGAAATGCCAGAAATTAACCAATCATAAACCCCTTTCAAAATAAAAGCATTATTTGTTTTTATTATTTTAAAT 1890
ACAACAGAAATCAATTTTATTGTAACACTAGCAGAGTTCTTCCCTCTGTACAAGGTGGACGGTTTAAACCTGGAGCTCAAGCCACAGACT 1980
GAGAGCTAGTGTAGCATTTGTCTGTGGTTTGTCTCGTATGAGTGAACAGAGGCATTGTGCATAATAAAATGCATTTTCAGAGAATATGCATTT 2070
TACCTTTGGGAATATGTTAATTTACGGCAGCATTCCCTATGGGAAGGTGATACAGCTCTGATATGCAAGCATATGATAATTTATCAT 2160
TCTAATCTCAACATATAATAGGGATTTGTGACCTGATATTTGGAGATGTAAATATTGCTCAGCATATTAATCCCTGATGGAAATATAGCATT 2250
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GGTGGCTTCAGAACCCAGGAAGTGGCCAGGGCCACAGACTCTGCTGGAGGCTGAGCCGGGGTTCCATAGGAGACTGACAGGAGACAT 2430
TTTGCCCTTAGGCCACAAAAGAAGAGCTACCCCACTTACAGATGCAGACCATGTGGGGCTCCGGAGAACTGCTTGTAGCATGGTTCT 2520
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GACCTTTGTGCGAGGTGTATACAGCCCTTACCTCACCACTTGGCAGCGACACAGAGCCTGCAGCACTACCGAAACCTACTACCGGACTGC 2700
CTATCGCCGTAGCCCTGGGGTGAATCCCGCAAGGCCTCGCTATGCTGTGCTGCGCTGGTGGAGAGGACAGTGGGCTCCCTGGGGCTTG 2790
TGGAGCAGCAATATGCCAGCCTCCATGTGGGAATGGAGGAGTTTATCCGCCAGGACACTGCCGCTGCCCTGTGGATGGCAGGGAGATA 2880
CTTGGCAGACAGATGTTGATGAATGCAGTACAGGAGAGGCGAGTTGTCCCGAGCGCTGTGCAATACTGTGGGAAGTTACTGGTGCCAGG 2970
GATGGGAGGACAAAGCCCATCTGCAGATGGGACCCCTGCTGTAAAGAGGGGCGCTCCCTTTCCCCCAACCCCAAGCAGGAGG 3060
TGGACAGCATGGCGAGAGAGGAGGTGACAGGCTGCGGGTGGATGTGCTAGAAACAGAACTGCAGTTGGTGCTGGGCCCTTGC 3150
ACAGCCTGGCCTCTCGGTCCACAGAGCATGGGCTACAAGATCTGGCAGCCTGCTGGTGTCTTCTTGGAGGAACATCTGGGGTCTGTG 3240
AGTCCCACAAGACACCACTCCACCCACAGAGAGCTAGGGGACCATGGGGTGGACACAGGGCTGGGTGGATGGAACTTCTTCTGGGAT 3330
GGCAGATTGCAAGTTTACACTTTTCTCTCTCTGCTGCTGCTGCAAAAGATCTGTGATAACCTCTCACCAACAGGCTGGA 3420
TAGGAGCATATCCAGATCCCTTGTAGCCAGAGTTCAAGGACGCTGTCTGTGGTGGCTATGAGCAGAGCCCTGCTCATTTGCTCTCT 3510
TCTTAGGAGGTTCTAGGACTTGGGTATGGGAGTGGGGTCTTGTGTGACTCTTCAAGTGGGAGTGGGGAT 3600
TGTCTCCATCTTTGTCTAATAAAGCTGAGACTTGAAGAAAAAAA 3645

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Figure 2

Human DB1 DNA and Protein S q n c s:

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      10      20      30      40      50      60
AGCGGGGGGAGTGGGGAGGAGGGGGTTCGGCCGCCGCAGCCATGGAGGCCAACTGGACCG
                                M E A N W T>

      70      80      90     100     110     120
CGTTCCTGTTCCAGGCCCATGAAGCTTCCCATCACCAACAGCAGGCAGCACAGAACAGCT
A F L F Q A H E A S H H Q Q Q A A Q N S>

     130     140     150     160     170     180
TGCTGCCCCCTCCTGAGCTCTGCCGTGGAGCCCCCTGATCAGAAACCATTGCTTCCAATAC
L L P L L S S A V E P P D Q K P L L P I>

     190     200     210     220     230     240
CAATAACTCAGAAACCTCAGGGTGCACCAGAAACATTAAAGGATGCCATTGGGATTAAAA
P I T Q K P Q G A P E T L K D A I G I K>

     250     260     270     280     290     300
AAGAAAAACCCAAACTTCATTTGTGTGCACTTACTGCAGTAAAGCTTTCAGGGACAGCT
K E K P K T S F V C T Y C S K A F R D S>

     310     320     330     340     350     360
ATCACCTGAGGCGCCACGAATCCTGCCACACAGGGATCAAGTTGGTGTCCCGGCCAAAGA
Y H L R R H E S C H T G I K L V S R P K>

     370     380     390     400     410     420
AAACCCCCACCACGGTGGTTCCCCCTTATCTCTACCATCGCTGGGGACAGCAGCCGAACCT
K T P T T V V P L I S T I A G D S S R T>

     430     440     450     460     470     480
CGTTGGTCTCGACCATTGCAGGCATCTTGTCAACAGTCACTACATCTTCCTCGGGCACCA
S L V S T I A G I L S T V T T S S S G T>

     490     500     510     520     530     540
ACCCCAGTAGCAGTGCCAGCACCAAGCTATGCCAGTGACCCAGTCTGTCAAGAAACCCA
N P S S S A S T T A M P V T Q S V K K P>

     550     560     570     580     590     600
GTAAGCCTGTCAAGAAGAACCATGCTTGTGAGATGTGTGGGAAGGCCTTCCGAGATGTGT
S K P V K K N H A C E M C G K A F R D V>

     610     620     630     640     650     660
ACCATCTCAATCGACACAAGCTCTCCCATTCAGATGAGAAACCCTTTGAGTGTCCCTATTT
Y H L N R H K L S H S D E K P F E C P I>

     670     680     690     700     710     720
GTAATCAGCGCTTCAAGAGGAAGGACCGGATGACTTACCATGTGAGGTCTCATGAAGGAG
C N Q R F K R K D R M T Y H V R S H E G>

     730     740     750     760     770     780
GCATCACCAAACCTATACTTGCAGTGTGTTGTGGGAAAGGCTTCTCAAGGCCTGACCACT
G I T K P Y T C S V C G K G F S R P D H>

```

Figure 2 (con't)

790 800 810 820 830 840
 TAAGCTGTCATGTAAAACATGTCCATTCAACAGAAAGACCCTTCAAATGCCAAACGTGCA
 L S C H V K H V H S T E R P F K C Q T C>
 850 860 870 880 890 900
 CTGCTGCCTTTGCCACCAAAGACAGACTGCGGACACACATGGTGCGCCATGAAGGCAAGG
 T A A F A T K D R L R T H M V R H E G K>
 910 920 930 940 950 960
 TATCATGTAACATCTGTGGGAAGCTCCTGAGTGCGAGCATAACATCACCAGCCACTTAAAGA
 V S C N I C G K L L S A A Y I T S H L K>
 970 980 990 1000 1010 1020
 CTCATGGGCAGAGCCAAAGTATCAACTGTAATACATGTAAACAAGGCATCAGTAAAACAT
 T H G Q S Q S I N C N T C K Q G I S K T>
 1030 1040 1050 1060 1070 1080
 GCATGAGTGAAGAGACCAGTAACCAAAAGCAGCAGCAGCAGCAGCAGCAACAACAAC
 C M S E E T S N Q K Q Q Q Q Q Q Q Q Q>
 1090 1100 1110 1120 1130 1140
 AACAAACAACATGTGACAAGCTGGCCAGGGAAGCAAGTAGAAACACTCAGACTGTGGGAAG
 Q Q Q H V T S W P G K Q V E T L R L W E>
 1150 1160 1170 1180 1190 1200
 AAGCTGTTAAAGCAAGGAAGAAAGAAGCTGCTAACCTGTGCCAAACCTCCACGGCTGCTA
 E A V K A R K K E A A N L C Q T S T A A>
 1210 1220 1230 1240 1250 1260
 CGACACCTGTGACTCTCACTACTCCATTTCAGTATAACATCCTCTGTGTCGTCTGAGACTA
 T T A P V T L T T P F S I T S S V S S E T>
 1270 1280 1290 1300 1310 1320
 TGTCAAACCCAGTCACAGTGGCAGCTGCAATGAGCATGAGAAGTCCAGTAAATGTTTCAA
 M S N P V T V A A A M S M R S P V N V S>
 1330 1340 1350 1360 1370 1380
 GTGCAGTTAACATAACCAGCCCAATGAACATAGGGCATCCTGTAACCTATAACCAGTCCAT
 S A V N I T S P M N I G H P V T I T S P>
 1390 1400 1410 1420 1430 1440
 TATCCATGACCTCTCCTTTAACTCACTACCCCAGTCAACCTCCCCACCCCGTCACTG
 L S M T S P L T L T T P V N L P T P V T>
 1450 1460 1470 1480 1490 1500
 CCCAGTGAATATAGCACACCCTGTCACCATCACATCTCCAATGAATCTACCCACACCTA
 A P V N I A H P V T I T S P M N L P T P>
 1510 1520 1530 1540 1550 1560
 TGACATTAGCCGCCCCTCTCAATATAGCAATGAGACCTGTAGAGAGCATGCCTTTCTTGC
 M T L A A P L N I A M R P V E S M P F L>

Figure 2 (con't)

1570 1580 1590 1600 1610 1620
CCCAAGCTTTGCCTACATCACCGCCTTGGTAAACAGTATTATAAAATCAAAATATGGGTA
P Q A L P T S P P W *>

1630 1640 1650 1660 1670 1680
AAAGTAAATATTTACCAGCAACTTAACTTTTAGTTGATTAAAGCAAAAAGTAAACCATGA

1690 1700 1710 1720 1730 1740
AATTGGGAGATTTTATTACATTAGTTAATAAGAGTGTGGTAGCATTTTCTCCAATTTGG

1750 1760 1770 1780 1790 1800
CTGGGATTATTCAAAGTAGGGTGTGTATGTAACCTTATCACTGGACCACCTTTAGTTTAATC

1810 1820 1830 1840 1850 1860
AGAAATTCCTTTTAGCTGACAACATTGCTTAAACAGGATAGTAGTTGGCAAGATGAAATG

1870 1880 1890 1900 1910 1920
CCAGAATTAAAACCAATCATAAGTAGAACCCACTTCAAAATAAAAAACAGCATTACTAT

1930 1940 1950 1960 1970 1980
TTCTAATCCCAAGGAATCACTTTATTGTAAACACTAGCAGAACTCTTCTCCCTATACAAG

1990 2000 2010 2020 2030 2040
GTGGATGGCTGATTTTAACCTGAAATTTTAAATCCACAGATTGAGAGCTAGTGTAGAATT

2050 2060 2070 2080 2090 2100
GTCTGTGTTTATTGTTTTTATGAGTAAATACATGCATTGTCATAATAAAATGCATTTTCAG

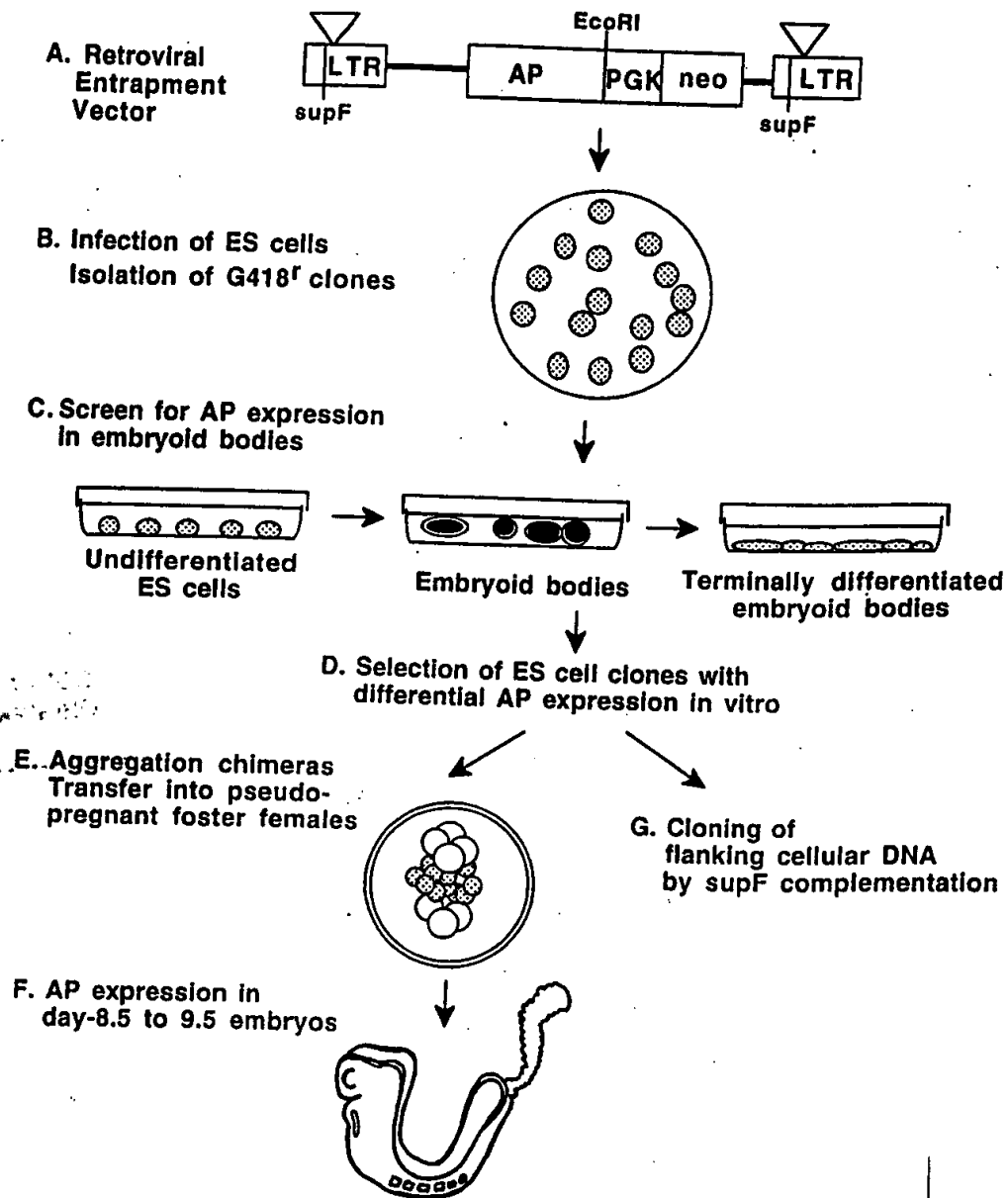
2110 2120 2130 2140 2150 2160
AGAATATGCATTTTACCTTTGGGAATATGTTAATTCAGGCAGCATTCCTATGGGAAAG

2170 2180 2190 2200 2210 2220
GTGATACCAAGCTCTGATATGCAAAGCATATGATAATTTATCATTCTAACTTCAACGTATA

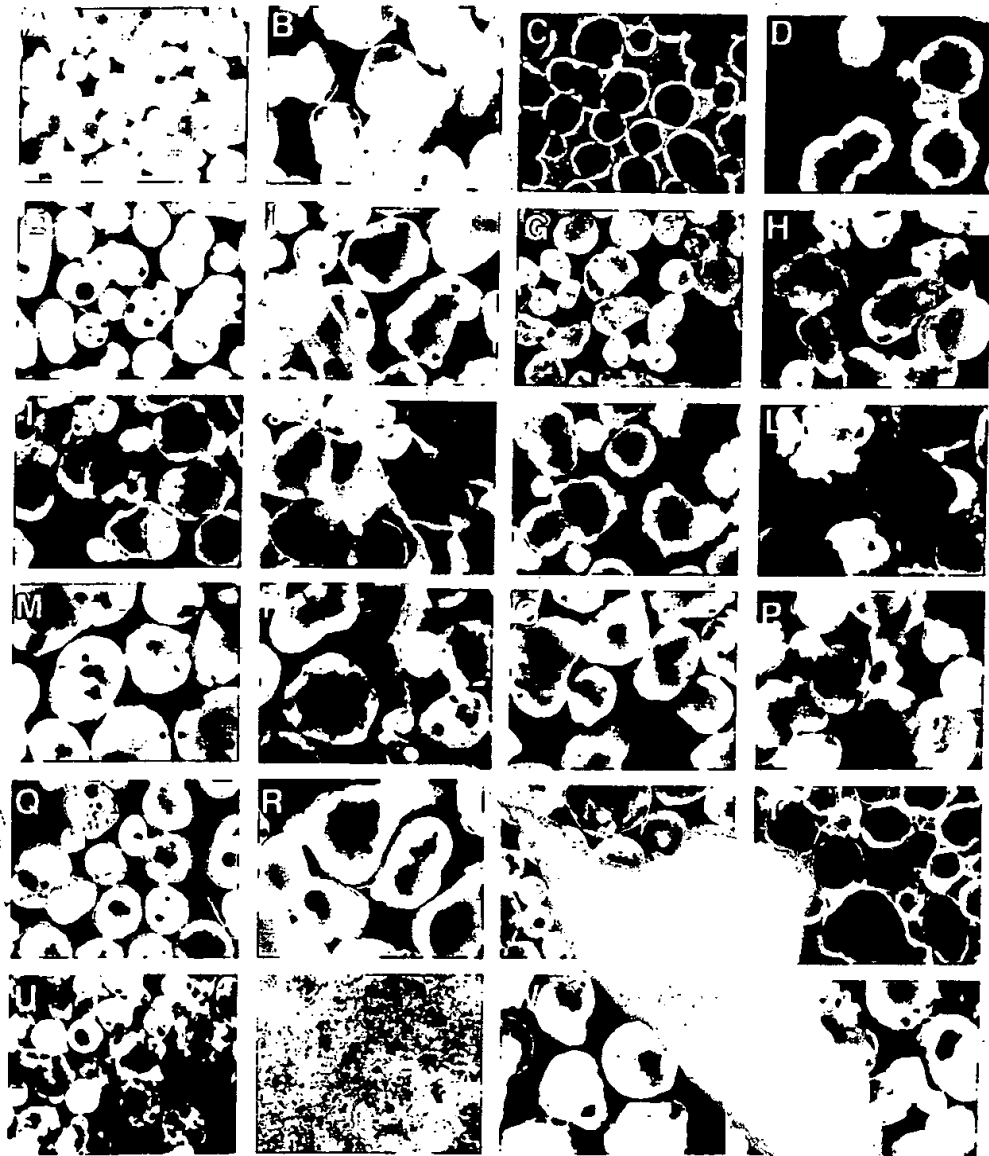
2230 2240 2250 2260 2270 2280
ATAGGGATTGTGACCTGATATTTGGAGATGTAAATATTGCTCAGCATATTAATCCCGATG

2290 2300
GAATATAGCATTGTAGTTGACTTTTT

Figur 3



Figur 4



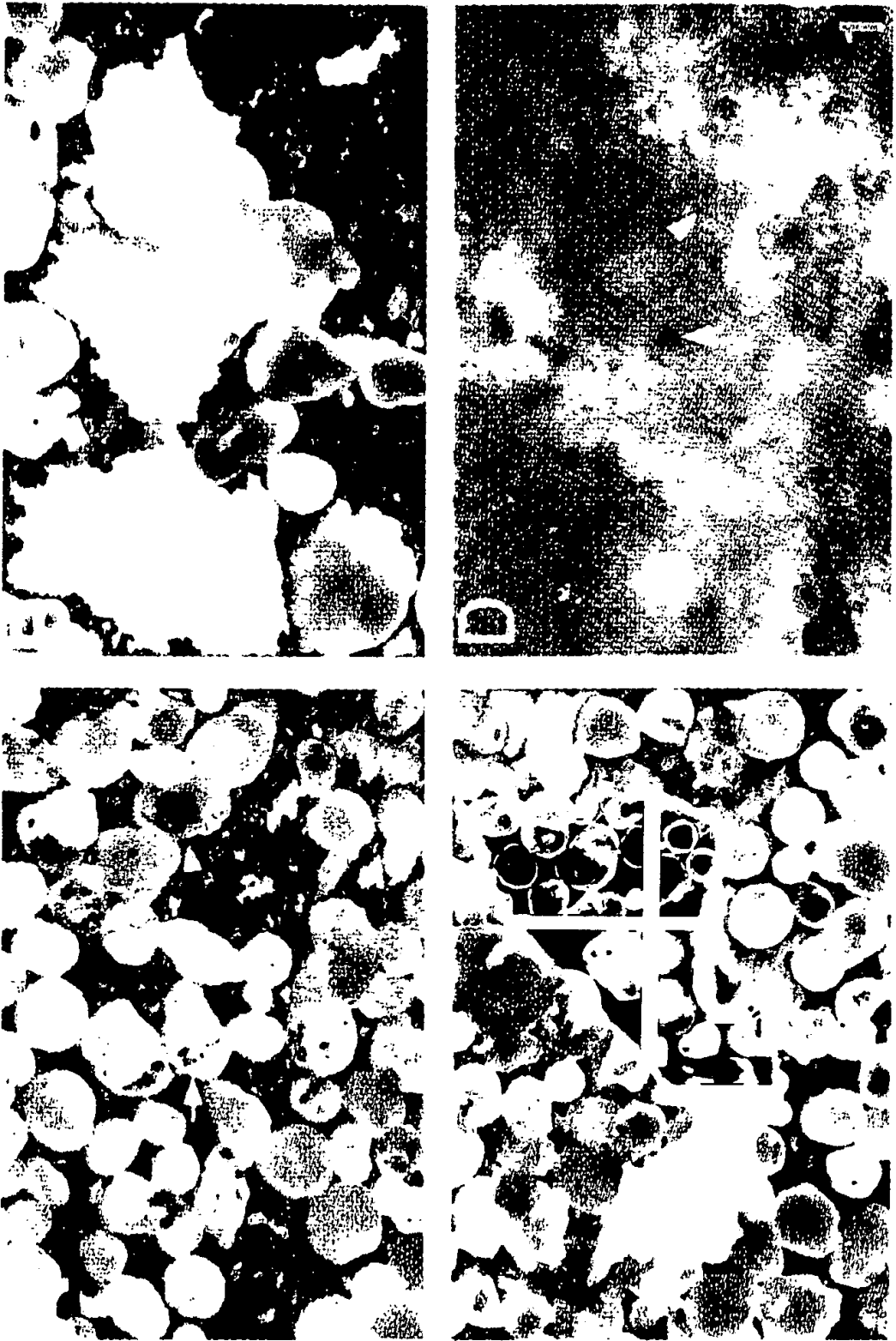
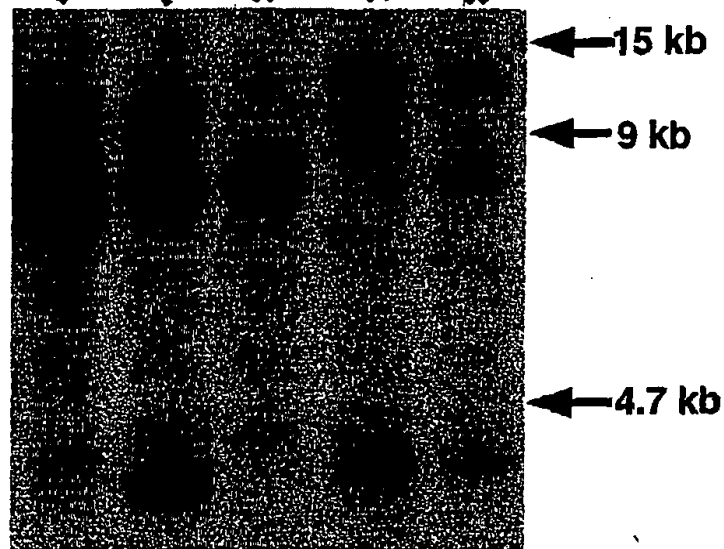


Figure 5

with the following results:

ES 1-13 ES +/- tail -/- tail +/- tail



[illegible]

9/20

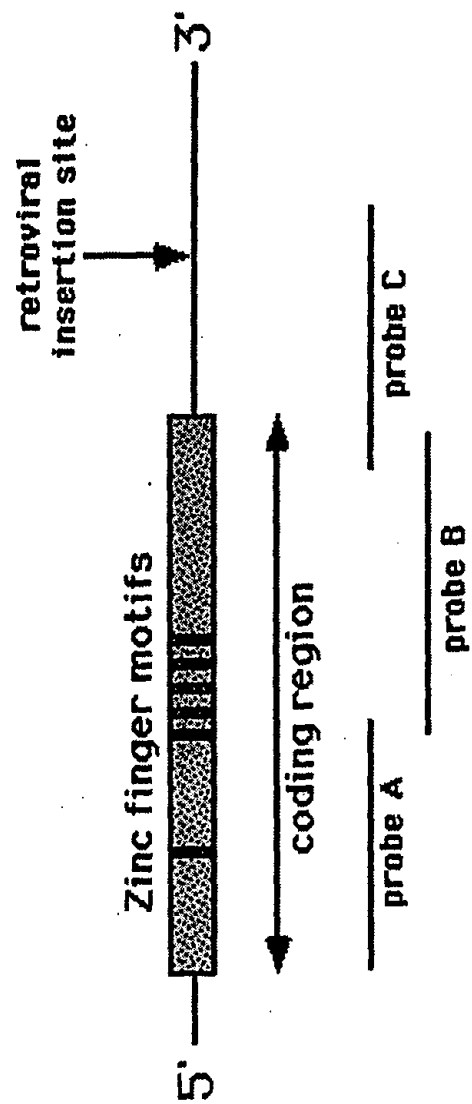


Figure 8



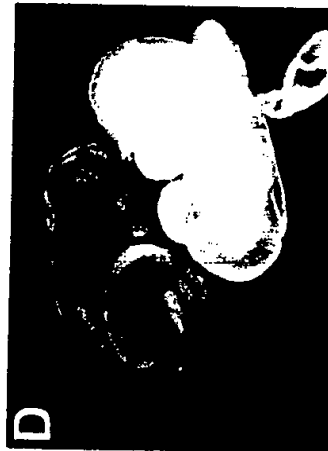
E7.25



E7.5



E8.5



E9.5



E10.5



E11.5

Figure 9

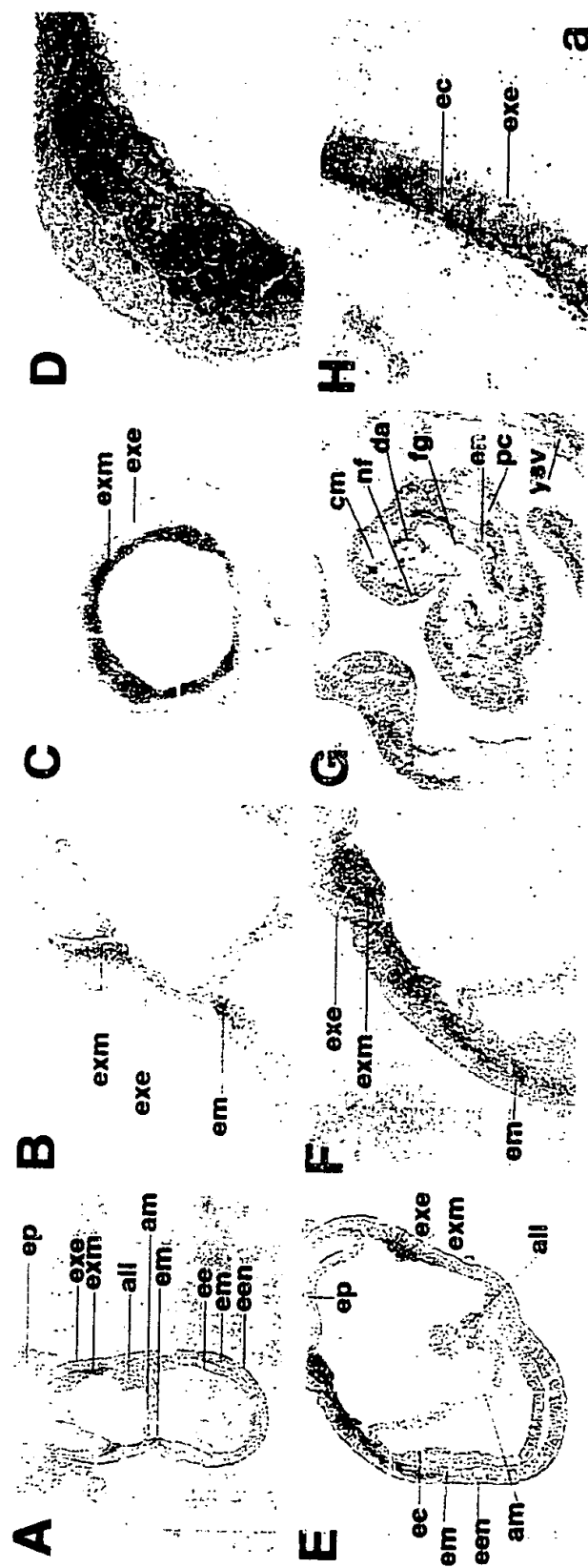
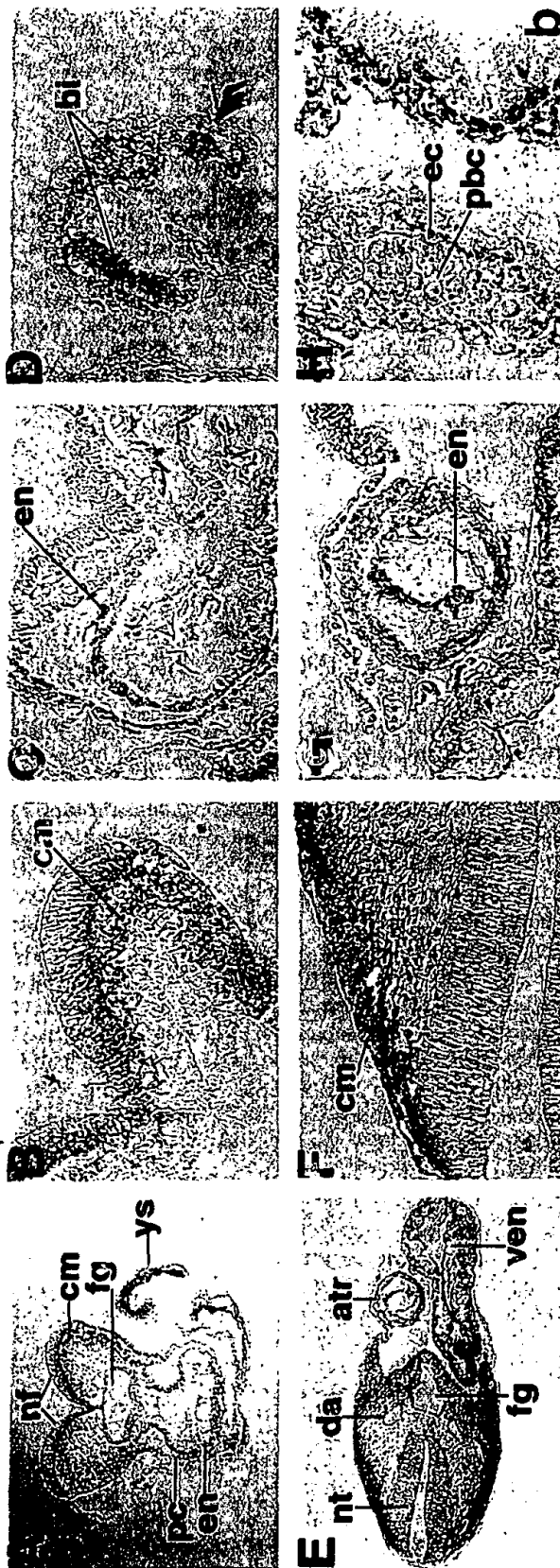


Figure 10

Figure 11



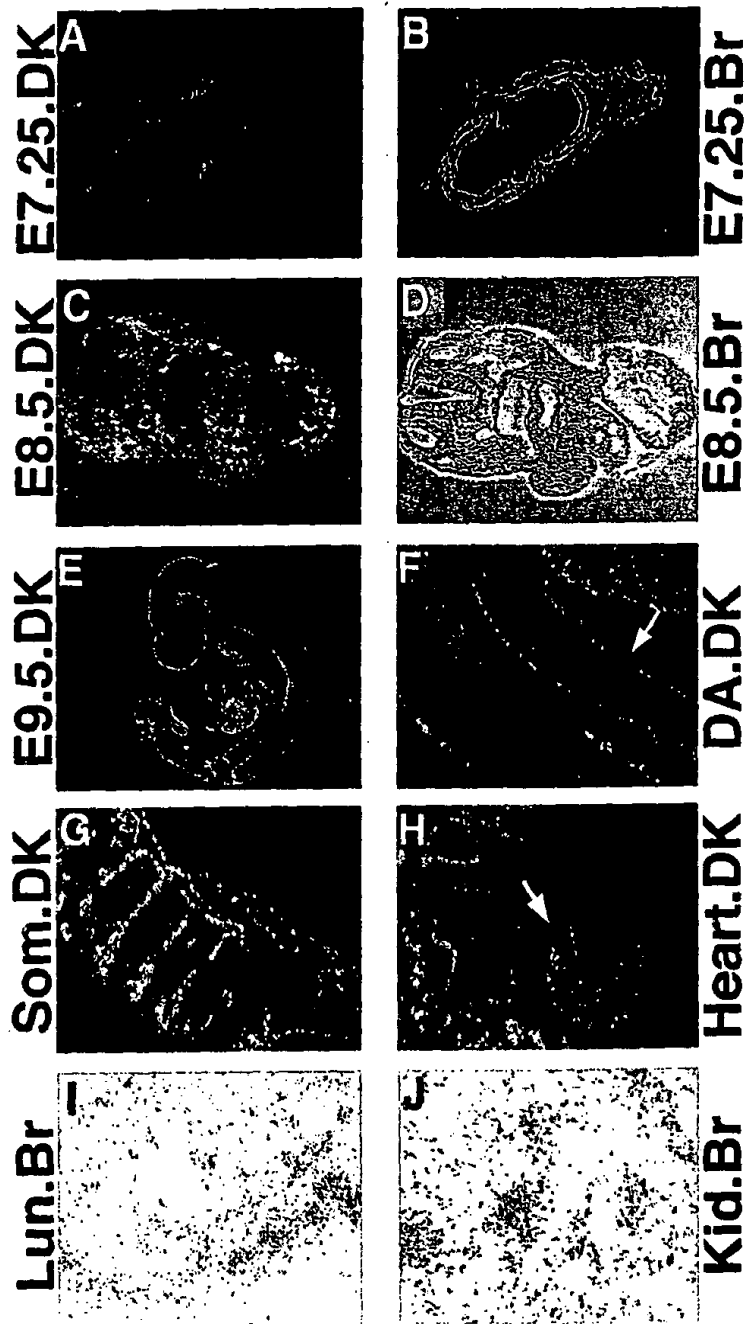
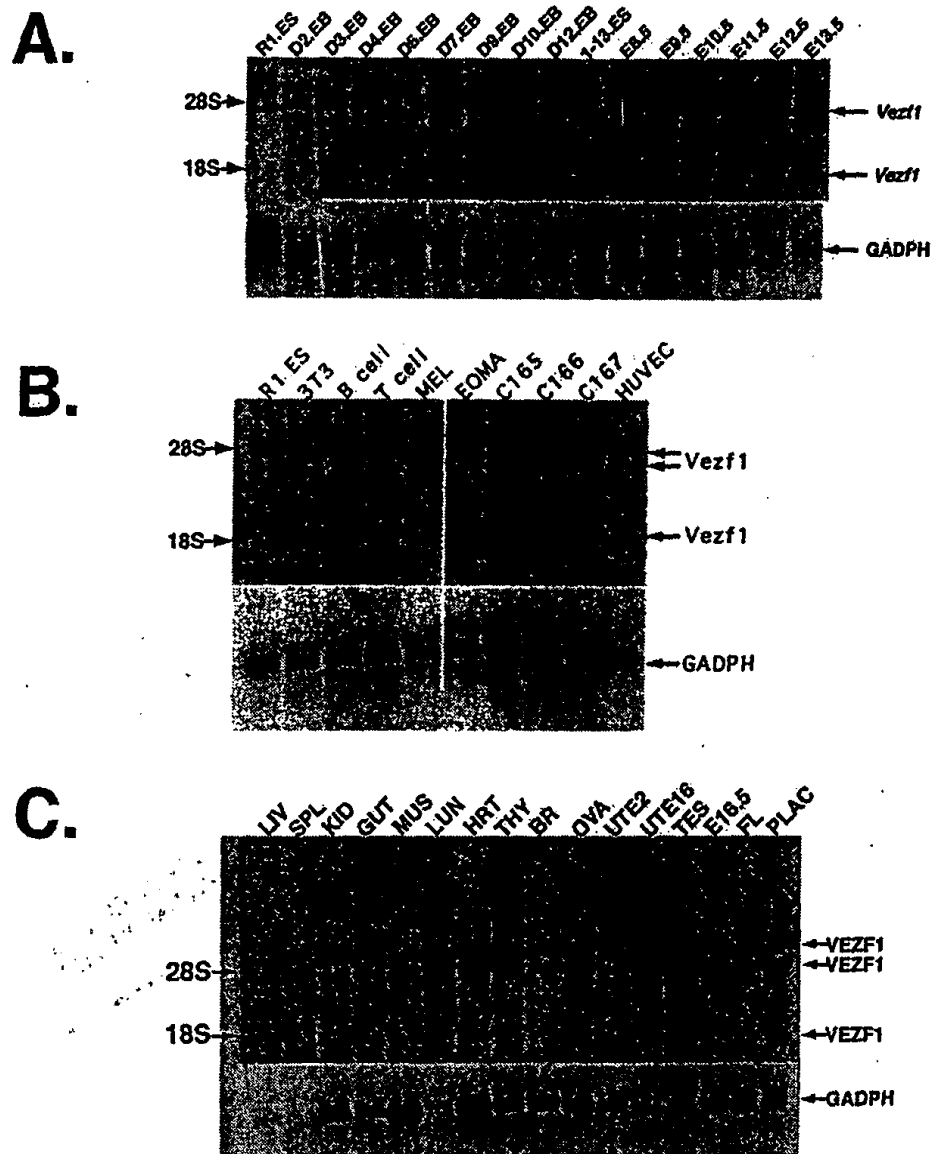


Figure 12

Figure 13



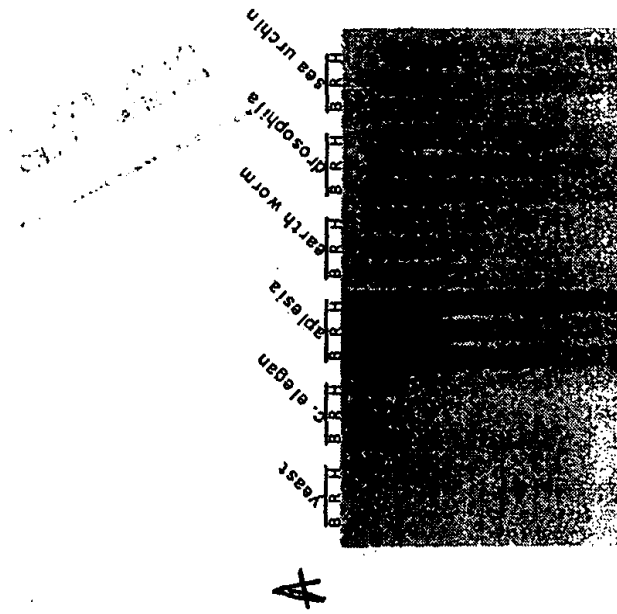
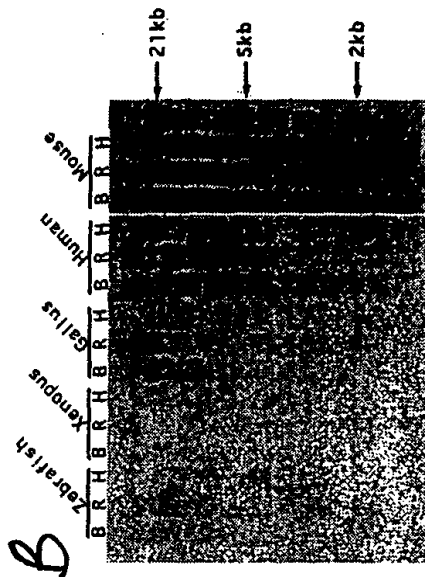
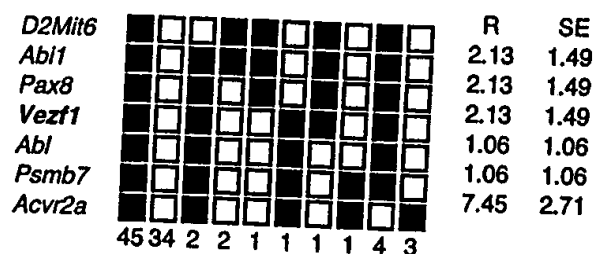


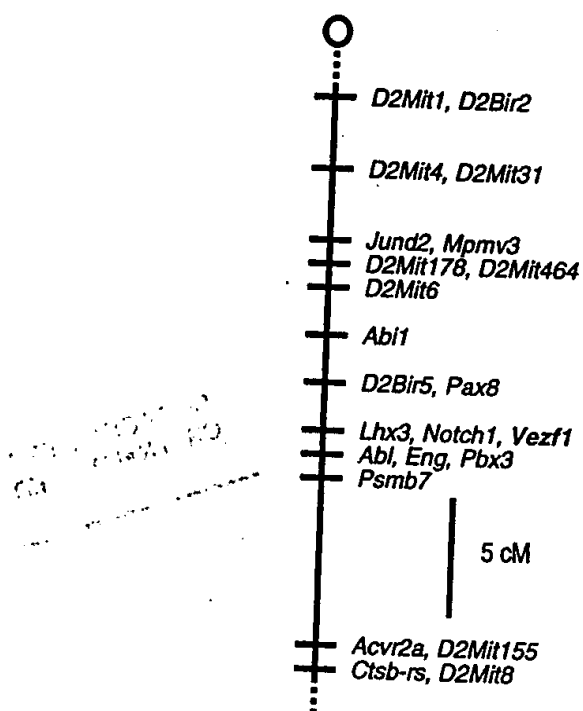
Figure 14

1. The first step is to identify the problem or question that needs to be answered.

A: Jackson BSS Chromosome 2

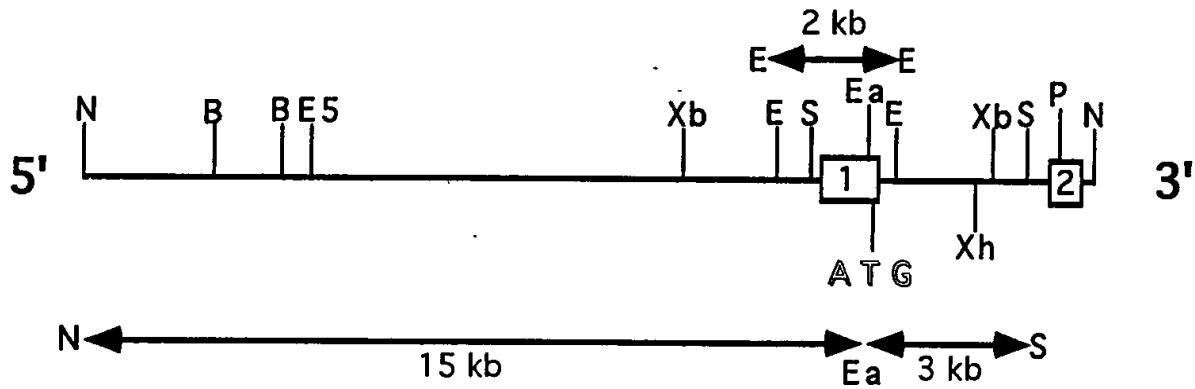


B: Jackson BSS Chromosome 2



Figur 16

Restriction Enzyme Map of a 20 kb Genomic DNA of the Vezf1 Gene



BamHI (B), EcoRI (E), EcoRV (E5), EagI (Ea), NotI (N), PstI (P), SacI (S), XbaI (Xb), and XhoI (Xh).

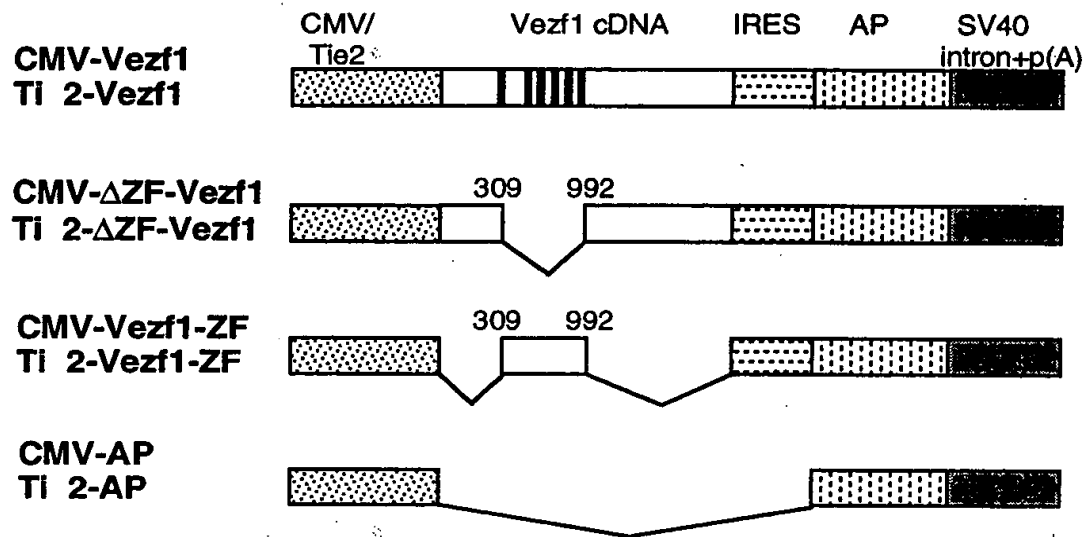
— Intronic sequence;

1 Exon 1

2 Exon 2

Figure 17

Vezf1 EXPRESSION VECTORS



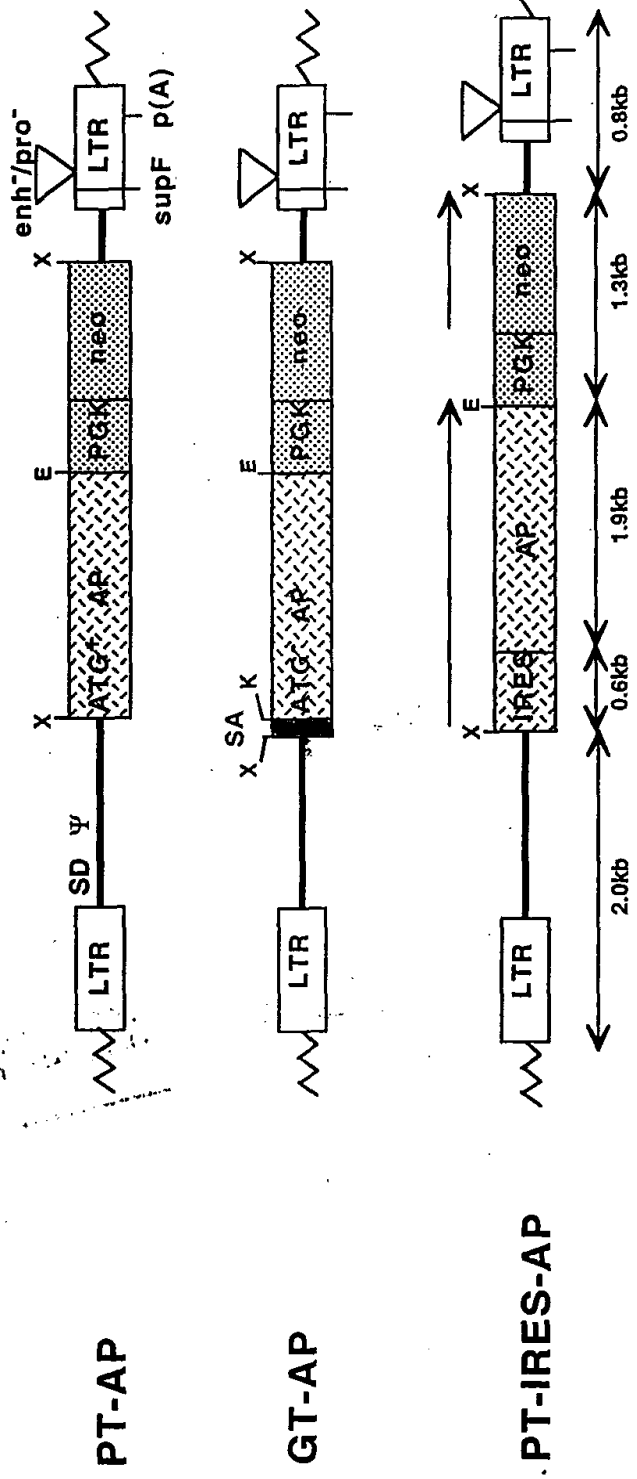


Figure 18